MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, **2015/2016**

HAP 1011 – HUMAN ANATOMY & PHYSIOLOGY

(All Sections/Groups)

05 OCT 2015
2.30 – 4.30 PM
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 4 printed pages, including this cover page.
2. All questions are worth 10 marks each.
3. Attempt **Five out of Seven questions.**
4. Please print all your answers in the answer booklet provided.

QUESTION 1 - Introduction

a) Define Homeostasis.

[1mark]

b) Give two examples of diseases that involve homeostasis imbalance.

[2 marks]

c) With the aid of a diagram, describe the negative feedback process in order to maintain the body blood pressure within a normal range.

[7 marks]

QUESTION 2 - Cardiovascular

a) High altitude climbers have higher risk of developing Hypoxia (altitude sickness) than normal people. With the aid of a diagram discuss the mechanism used by your body to prevent development of hypoxia when you are climbing a mountain such as Mt. Kinabalu.

[4 marks]

b) The resting heartbeat of an athlete can fall below 40 beats per minute. Discuss the changes occur in the heart of those high performance athlete.

[2 marks]

c) Mr. Gan has symptoms of arrhythmia. According to the cardiologist he will need a pacemaker to maintain his heart function. Explain the possible cause of his problem and how the pacemaker may help in this situation.

[4 marks]

QUESTION 3 - Respiratory

a) Alveolar septal cells (Type II) secrete alveolar fluid which contains a component called **surfactant**. What are the functions of surfactant on the alveolar lining?

[2 marks]

b) Experimental evidence suggests that overuse of erythropoietin (EPO) reduces athletic performance. What side effects of EPO abuse reduce exercise stamina?

[2 marks]

c) Discuss the role of pulmonary gas exchange, especially CO_2, in the regulation of blood plasma pH.

[4 marks]

d) What is forced expiratory volume in 1 second and why it is clinically important?

[2 marks]

Continued...

QUESTION 4 - nervous system

a)

TABLE 11.1 Representative Concentrations of the Principal Cations and Anions in Extracellular and Intracellular Fluids in the Human Body

Ions	Intracellular Fluid (mEq/L)*	Extracellular Fluid (mEq/L)
Cations (Positive)		
Potassium (K^+)	148	5
Sodium (Na^+)	10	142
Calcium (Ca^{2+})	<1	5
Others	41	3
TOTAL	200	155
Anions (Negative)		
Proteins	56	16
Chloride (Cl^-)	4	103
Others	140	36
TOTAL	200	155

i. Referring to table 11.1, give you best estimation of the human neuron resting membrane potential and why neuron stay in this potential during resting?
ii. What are the characteristic in all excitable cells that are responsible for maintaining the resting membrane potential?

[4 marks]

b) Compare and contrast the terms in neurology;
i. Action potential and Graded Potential
ii. Inhibitory Postsynaptic Potential and Excitatory Postsynaptic Potential

[4 marks]

c) Have you ever wonders, why some foods are tastier than others? From you knowledge about special senses, describe how your tongue senses work. Choose 2 tastes to illustrate your explanation.

[2 marks]

Continued...

QUESTION 5 - endocrine

a) List 3 endocrine hormones. For each one state where it is produced, what regulates its production, and what its target is?

[3 marks]

b) Compare the structure and function of endocrine and exocrine glands. Give one example of each type.

[2 marks]

c) A patient arrives at the emergency room in an unconscious condition. A medical emergency bracelet reveals that he has diabetes. The patient is either in diabetes coma or insulin shock. How can you tell which, and what treatment do you recommend for each condition?

[5 marks]

QUESTION 6 - renal system

a) Facts: alcohol inhibits ADH secretion, and caffeine causes dilation of the afferent arterioles in the kidneys.
IF Mr Smith drinks several alcoholic beverages, and then drinks several cups of coffee, does his urine production change, and if so, how and why?

[4 marks]

b) How do the kidneys contribute to the blood acid-base balance (pH)? Which part of the kidney / nephron plays the main role? How can hard exercise cause the blood, and thus the urine, to become more acidic?

[4 marks]

c) "Fresh" urine has very little smell, but shortly afterwards it can have a very strong smell. Explain how this happens.

[2 marks]

QUESTION 7 - reproduction

a) Suppose you want to produce a birth control pill for men. On the basis of what you know about male hormone system, what process should the pill affect? Discuss any possible side effects of the pill.

[4 marks]

b) Draw a timeline for the female ovarian/menstrual cycle, from day 1-28. Show the changes in levels of FSH, LH, estrogen and progesterone during the month. Also draw the basal temperature curve. What day is ovulation (usually)? What hormone levels correlate with ovulation?

[6 marks]

End of Paper